

Fosnaugh Truss-Leg Bedstead Bridge  
Spanning Scippo Creek at Township Route 128  
Stoutsville vicinity  
Fairfield County  
Ohio

HAER No. OH-43

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OHIO,  
23-STOVIV,  
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

Historic American Engineering Record  
National Park Service  
U. S. Department of the Interior  
P. O. Box 37127  
Washington, D. C. 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

Fosnaugh Truss Leg Bedstead Bridge

HAER No. OH-43

Location: Township Route 128 over Scippo Creek, 1 mile south of Stoutsville, Clear Township, Fairfield County, Ohio

UTM Coordinates: 17/343080/4383630

Date of Construction: 1891

Present Owner: County of Fairfield (Board of Commissioners)  
County Courthouse  
Main Street  
Lancaster, Ohio

Present Use: Vehicular traffic

Significance: The Fosnaugh Truss leg Bedstead Bridge was built by the Hocking Valley Bridge Works (HVBW) of Lancaster, Ohio in 1891. HVBW was a small firm founded by Augustus Borneman in 1881. This bridge is almost identical to Borneman's 1879 patent for an improved truss bridge. After the Ashtabula bridge disaster in 1876, where a large, cast-and-wrought iron Howe Truss failed under the weight of a locomotive, questions were raised regarding the durability of composite cast and wrought iron bridges. Thus, patents received by Ohioans tended to be for small span bridges for country highways, and often for construction in wood, or wood and metal, in addition to improvements to all metal constructed bridges. The Fosnaugh bridge then, is typical of the kind of design produced and built during this period in that it sought to improve on metal bridge designs. Specifically, the Fosnaugh bridge's improved design concentrated on protection of the major connecting

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points. The bridge is listed as a "selected bridge" in the Ohio Department of Transportation's Ohio Historic Bridge Inventory Evaluation and Preservation Plan.

Report

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The Fosnaugh Bridge was built by the Hocking Valley Bridge Works of Lancaster, Ohio in 1891. The bridge is referred to in the County Engineers records as the Fosnaugh Bridge, the name of which presumably comes from the Fosnaugh family who owned land in the area. That name however, is not used in the County Commissioners Journals. Instead, it is recorded on 4 July 1891 that Benjamin Dum, who owned the Hocking Valley Bridge Works at this time, was to be paid the balance (\$231.50) on the iron superstructure of Scippo Bridge.<sup>1</sup> As the Fosnaugh Bridge goes over the Scippo Creek, and as it is a metal bridge, it seems likely that the entries are referring to it. Various other payments are made in the following months.<sup>2</sup>

The Fosnaugh Bridge is of metal and is four panels in length. It has an overall length of 52 feet and the deck is 14-1/2 feet wide. The upper chords, which consist of a top plate rivetted to two, six inch channels, rest directly on stone pillars at either end. The upper chord and the three intermediate cruciform columns are compressive members. The bottom chord extends diagonally downwards from either end of the top chord, the outer ends of which are threaded and are held tight against a metal end plate by nuts. The bottom chords are looped into eyes and connected by pins at their inner panel points. 'I-section' floor beams, which carry the deck, are held at the panel points between the vertical cruciform columns above and the segments of eye-bar bottom chord members beneath. The bridge is stiffened by diagonal bracing in the two middle

panels. The bracing can be tightened by means of sleeve nuts. The diagonal bracing and bottom chord are tensile members. The bridge is a truss leg bedstead, that being a Pratt truss (one in which the upper chord and vertical posts are in compression) with vertical end posts embedded in their foundations. This is an unusual example having stone end posts.

Although now much damaged, the ends of the upper chords were originally hidden beneath decorative castings surmounted by a finial. The finials still survive, but the end plates, at least one of which bore the name of the Hocking Valley Bridge Works (and which were still there until recently) are missing.

The Fosnaugh bridge is typical of the kind of small bridges being produced in Ohio after the mid 1870s, and as such well illustrates the state of bridge building in Ohio in the last quarter of the 19th century. Many bridge patents were issued to Ohioans after 1850, most of them for highway bridges. Over forty patents were issued during the 1870s alone, and although it could be costly both in time and money for a builder to apply for a patent, there could be considerable advantages for him if he was successful in his application. He received license fees when the design was used (within the 17 years duration of the patent), or he could sell the rights to his design outright to one company. It also gave him a good selling point to be able to advertise his 'patent' design.

The time of experimentation was brought to an abrupt halt, however, in 1876 when a bridge (a metal Howe truss) collapsed under the weight of a passenger train, during a bad storm in Ashtabula, Ohio, killing ninety people. The accident aroused public and professional interest. Was it improperly constructed? Had eleven years of service worn it down? Was there no safe way of making iron bridges? According to the bridges designer, Joseph Tomlinson, he never approved a wrought-iron Howe Truss for long spans because it made the bridge unnecessarily heavy and placed all the strains on the end brace. Regardless, the disaster's effect on the number of patents issued to Ohioans was dramatic. The number dropped drastically and those that were issued were for wooden or combination wood and iron bridges, and went mainly to small, local bridge builders, not to anyone connected with the major bridge building companies. After 1876 the larger companies in Ohio tended to go back to the standard designs, such as the Pratt or Whipple trusses, which proved to be more reliable. The return to wooden construction was not wholesale, but was mainly connected with the market for small span country highway bridges. In fact, wooden construction had never completely died out in Ohio. After 1876, designers turned to finding ways of overcoming the old problems of building in wood. There were attempts, for example, to protect the wood from water damage by, in one case, covering it with metal plates.<sup>3</sup>

The structure of this bridge is almost identical to that described by Augustus Borneman in his specification for an improved truss bridge (US patent No. 219,846, dated 23 September 1879). Borneman says in the patent specification that this bridge (which could be built as a metal or combination wood and iron truss) supported on pillars will last better than a bridge "which has its main support on abutments on the level of the ground, and is thus constantly exposed to dampness from the earth". He also states:

The advantage in raising this bridge consists in the fact that it can be done without false works or trestles. In practice I can with four men raise and finish a forty-foot bridge in four hours.

The Fosnaugh bridge is a small bridge built by a local firm, and based on a bridge patent received by a local designer. Although it is of metal, the patent states that it can also be built in a combination of wood and iron. The caps at the main connections of the upper chord and the end posts give protection to those major connecting points, which would be especially useful for a combination bridge. The raising of the structure on stone endposts protects it from the effects of moisture. The Fosnaugh bridge is a good example of the kind of small span bridge designed and built in Ohio in the late 19th century. (For further details of Borneman's career please see the report on the John Bright No. 1 Iron Bridge, HAER No. OH-44.)

NOTES

<sup>1</sup> Fairfield County, Ohio, County Commissioners Journal (4 July 1891) vol. 16, p. 88.

<sup>2</sup> There are a number of entries in the Fairfield County, County Commissioners Journal for payments concerning this bridge:

15 October 1890	Part payment for the superstructure of Scippo Bridge. (\$50)
25 October 1890	Part payment on the bridge. (\$100)
8 November 1890	Part payment for the bridge. (\$59)
15 November 1890	Balance due to A. H. Snoke for masonry of Scippo Bridge. (\$255.71)
20 June 1891	William Wils(?) Jr. for approach to Scippo Bridge. (\$8)
12 November 1892	Balance due to John Reichelderfer for gravel fill at Scippo Bridge. (\$10)
12 November 1892	To Benjamin Dum the balance on the superstructure of Scippo Bridge. (\$14.49)

<sup>3</sup> David A. Simmons, "The Risk of Innovation: Ohio Bridge Patents in the 19th Century." Proceedings of the First Historic Bridges Conference November 1, 1985. (Columbus, Ohio: Ohio State University and Ohio Historical Society, 1985).



BIBLIOGRAPHY

Fairfield County, Ohio. County Commissioners Journal (1890-92)

Simmons, David A. "The Risk of Innovation: Ohio Bridge Patents in the 19th Century." Proceedings of the First Historic Bridges Conference, November 1, 1985. Columbus, Ohio: Ohio State University and Ohio Historical Society, 1985.